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Remote Environmental DataLink (REDL)

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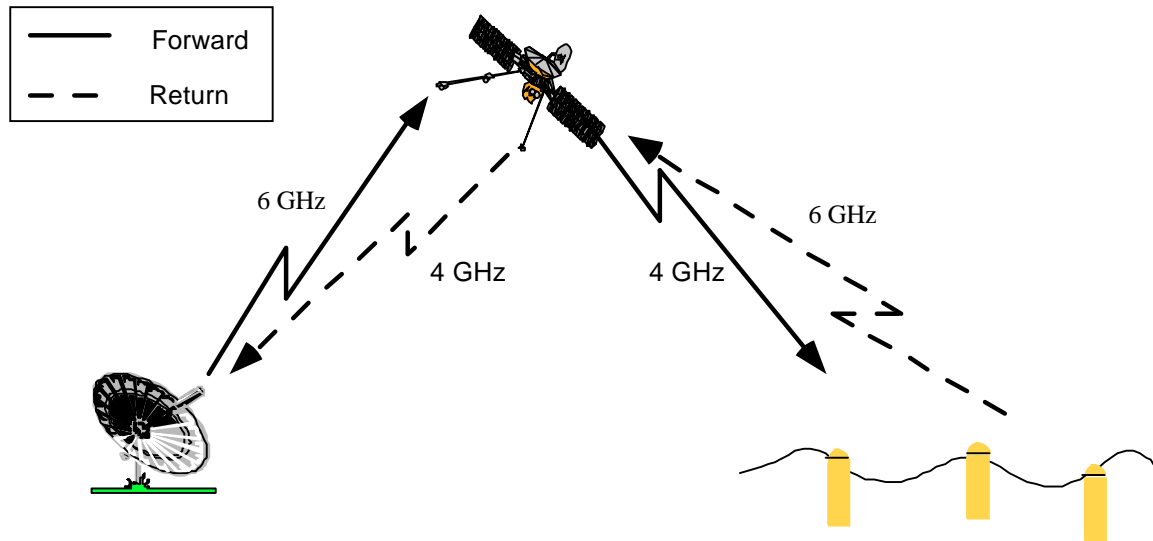
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LONG-TERM GOAL

My long term goal is to develop and demonstrate a global two way datalink for collection of environmental data from buoys at sea. The proposed datalink would provide a two way datalink with 10 to 100 times the capacity of ARGOS at a fraction of the yearly cost. This datalink uses existing commercial, geosynchronous satellites.

OBJECTIVES

I planned to design and demonstrate a prototype of the proposed datalink over-the-air using a specified buoy. The primary objective was to demonstrate link closure at the predicted data rates and power using existing geosynchronous satellites.



APPROACH

The proposed approach was to complete the system, hardware and software design and test and demonstrate a prototype terminal and hub configuration. The demonstration goal was a functional, not form/fit demonstration and it addressed link closure rather than multi-access capabilities. Therefore, the demonstration architecture consisted of two terminals one at the buoy and one at the demonstration hub communicating with one another. The demonstration hub includes a 4.5m antenna versus the 13m antenna to be used for the production datalink. INTELSAT satellites would be used free of charge for over-the-air testing.

WORK COMPLETED

This is the second phase of a two phase Small Business Innovative Research (SBIR) program. We planned to complete our design and demonstrate the datalink. However, what we learned instead is the difficulty of designing a low data rate datalink for marine applications. We believe we have a much better understanding of the system and technical issues associated with such a datalink and will be able to use this knowledge and hardware and software designs in subsequent efforts to demonstrate this link. We are even more confident after this design effort that such a datalink is a practical possibility.

RESULTS

We completed the datalink system, hardware, and a majority of the software design.

IMPACT/APPLICATION

This effort forms a strong basis for follow-on efforts designed to demonstrate this datalink. There are two such efforts underway currently. The first, the Oceanographic Datalink (ODL) is another ONR effort to demonstrate this datalink. And the second, GLTS (Global Location and Tracking System), is an Air Force effort to demonstrate the use of this datalink for global asset tagging and tracking.

TRANSITIONS

The design completed in this effort is being used as the basis of the designs in the ODL and GLTS efforts.

RELATED PROJECTS

1 – ODL (Oceanographic DataLink), an Navy STTR phase I and II effort to demonstrate the use of this datalink in buoys and Autonomous Underwater Vehicles (AUVs). Phase I is complete, Phase II is just beginning, Tom Swean is the Navy technical point of contact.

2 – GLTS (Global Location and Tracking System), an Air Force SBIR phase I and II effort to demonstrate the use of this datalink for global asset tagging and tracking. Phase I is complete, Phase II is underway. Joe Mancini at Rome Labs is the Air Force technical point of contact..

REFERENCES

Feb. 1998. Remote Environmental DataLink Phase II Final Report.

PUBLICATIONS

Gamache, K.A., "Oceanographic Telemetry – The Future", *Oceans Community Conference*, Baltimore MD., Nov. 1998.